

11.0 AOC 15 – D & I AREA

11.1 LOCATION OF STUDY AREA

The D & I Area comprises approximately one acre within the Cantonment Area at the Fort McClellan, Alabama Army Installation (Fig. 1). The study area boundary was devised by adding a 50-ft buffer outside of the D & I Area site boundary.

11.2 AERIAL PHOTOGRAPH QUALITY ISSUES

A few photograph quality issues were encountered during photograph interpretation. They were corrected as follows:

- X **Quality** - In many areas of the photographs, the dynamic range of brightness values was insufficient to distinguish land cover classes. Due to extreme brightness (almost white), ground cover such as grass, bare soil, trails, and roads could not be differentiated. At other locations, extremely dark (nearly black) areas made it difficult to delineate grass from forested areas. Where appropriate, the problem areas of the photographs were subset and image enhancement techniques were applied. Simple adjustments to the brightness and contrast were conducted, or in more severe cases, a histogram equalization in the range of the lookup table was performed on the specific area where interpretation was difficult. Photographic interpretation could not be conducted on the 1937 or the 1940 photographs due to the poor quality of the photographs.
- X **Rectification** - Although second- and third-order transformations were used in the rectification of the digital photographs, several rectified photographs contained too much error within the D & I Area to accurately digitize land use/cover polygons. Factors contributing to the error included: (1) insufficient ground control points (GCPs) due to pronounced changes in land cover between years, (2) photographic distortion (location of the site in relation to the center of the photograph and the angle of the camera/aircraft when the photograph was acquired), and (3) terrain distortion (a single photograph may cover a large geographic area of varying elevations even though the site of interest may have little topographic relief). To improve the photographic registration of the study area, the D & I Area was subset from the rectified digital photographs in question and the newly-created image files were rectified separately. Photographic interpretation could not be conducted on the 1937 or the 1940 photographs due to insufficient ground control points for accurate rectification.

11.3 FINDINGS

Complete photographic coverage of the study area was available for eight years of photographic coverage from 1937 to 1994. A total of 73 anomalies were identified in the year-by-year land cover analysis (Fig. 2). All anomalies were inspected to ascertain the cause of each anomaly. All anomalies were resolved except for four unidentified objects. Anomalies potentially associated with waste disposal or chemical training activities were determined to be of potential concern and should be assessed by the USAESCH. During the final quality assurance review of the land use/cover anomalies, one anomaly was determined to be caused by a photographic interpretation error. The

anomaly is identified as “QA” in Table 1 and will not be discussed further. Of the remaining 72 anomalies identified, 64 were caused by new roads, pre-existing or former roads, buildings and removal of buildings, landscaping, the clearing of trees, and other cleared areas associated with the construction of a building complex. The remaining eight anomalies were the result of unidentified objects and the clearing of trees and/or groundcover; these anomalies are considered to be of potential concern.

1937. The 1937 photographs were not interpreted because of the poor quality of the available photographs. However, no pre-existing anomalous areas were identified during a visual inspection of the photographs (see Fig. 3a).

1937 to 1940. The 1940 photographs were not interpreted because of the poor quality of the available photographs. However, no anomalous areas were identified during a visual inspection of the photographs (see Fig. 3b).

1940 to 1944. Since the 1940 photographs were not interpreted, the 1940 land use/cover was not available. However, eighteen anomalies were identified in the land cover analysis for 1944 (see Table 1 and Fig. 3c). Fourteen of the anomalies were the result of buildings, landscaping, a road, and cleared areas associated with a building complex. The remaining four anomalies are of potential concern and were the result of unidentified objects (4 anomalies).

1944 to 1954. Thirty anomalies were identified during the land cover change analysis for the years 1944 and 1954 (see Table 1 and Fig. 3d). Twenty-nine of the anomalies were the result of new, pre-existing, and former roads, the removal of buildings, pre-existing and former unidentified objects, and former cleared areas. The remaining anomaly is of potential concern and was the result of the clearing of trees (1 anomaly).

1954 to 1961. Eight anomalies were identified during the land cover change analysis for the years 1954 and 1961 (see Table 1 and Fig. 3e). All eight anomalies were the result of pre-existing and former roads, and pre-existing unidentified objects. There are no anomalies of concern.

1961 to 1969. Seven anomalies were identified during the land cover change analysis for the years 1961 and 1969 (see Table 1 and Fig. 3f). Six of the anomalies were the result of pre-existing and former roads and a pre-existing unidentified object. The remaining anomaly is of potential concern and was the result of the clearing of trees (1 anomaly).

1969 to 1982. Six anomalies were identified during the land cover change analysis for the years 1969 and 1982 (see Table 1 and Fig. 3g). Four of the anomalies were the result of new and pre-existing roads, landscaping, and a former unidentified object. The remaining two anomalies are of potential concern and were the result of the clearing of trees (2 anomalies).

1982 to 1994. Three anomalies were identified during the land cover change analysis for the years 1982 and 1994 (see Table 1 and Fig. 3h). All three anomalies were the result of pre-existing roads and landscaping. There are no anomalies of concern.

Figure 1

Figure 2

Table 1. D & I Area - Anomaly Resolution

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies ¹
	1	1944	Cleared area (associated with building complex)	19, 21, 22, 24, 26, 43
	2	1944	Cleared area (associated with building complex)	None
	3	1944	Road	27, 28, 36, 52, 53, 62, 70, 71
	4	1944	Cleared area (associated with building complex)	4, 31, 55, 62, 70
	5	1944	Building	20, 21
	6	1944	Building	23
Yes	7	1944	Unidentified Object	25, 51, 60, 68
	8	1944	Building	48, 49
	9	1944	Building	32
	10	1944	Building	46, 47
	11	1944	Building	33
	12	1944	Building	41, 42
	13	1944	Building	34
	14	1944	Landscaping	35
Yes	15	1944	Unidentified Object	37
Yes	16	1944	Unidentified Object	38
Yes	17	1944	Unidentified Object	39
	18	1944	Cleared area (associated with building complex)	29, 30, 54, 56, 57, 63, 64
	19	1954	Former cleared area (first visible 1944)	1
	20	1954	Building removed (first visible 1944)	5
	21	1954	Road; building removed (first visible 1944)	1, 5, 22, 50, 58, 65, 73
	22	1954	Road	1, 21, 50, 58, 59, 65, 66, 73
	23	1954	Building removed (first visible 1944)	6
	24	1954	Former cleared area (first visible 1944)	1
	25	1954	Pre-existing unidentified (first visible 1944)	7, 51, 60, 68
	26	1954	Former cleared area (first visible 1944)	1
	27	1954	Pre-existing road (first visible 1944)	3, 52, 53, 62, 70, 71

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies ¹
	28	1954	Former road (first visible 1944)	3
	29	1954	Former cleared area (first visible 1944)	18, 57, 64
	30	1954	Former cleared area (first visible 1944)	18, 54, 63, 64
	31	1954	Former cleared area (first visible 1944)	4, 55, 62, 70
	32	1954	Building removed (first visible 1944)	9
	33	1954	Building removed (first visible 1944)	11
	34	1954	Building removed (first visible 1944)	13
	35	1954	Former landscaping (first visible 1944)	14
	36	1954	Former road (first visible 1944)	3
	37	1954	Former unidentified object (first visible 1944)	15
	38	1954	Former unidentified object (first visible 1944)	16
	39	1954	Former unidentified object (first visible 1944)	17
Yes	40	1954	Trees cleared	None
	41	1954	Former building (first visible 1944)	12
	42	1954	Former building (first visible 1944)	12
	43	1954	Former cleared area (first visible 1944)	1
	44	1954	Former cleared area (first visible 1944)	1
	45	1954	QA.	
	46	1954	Building removed (first visible 1944)	10
	47	1954	Building removed (first visible 1944)	10
	48	1954	Building removed (first visible 1944)	8
	49	1954	Building removed (first visible 1944)	8
	50	1961	Pre-existing road (first visible 1954)	21, 22, 58, 59, 65, 66, 73
	51	1961	Pre-existing unidentified (first visible 1944)	7, 25, 60, 68
	52	1961	Pre-existing road (first visible 1944)	3, 27, 53, 62, 70
	53	1961	Former road (first visible 1944)	3, 27, 52, 62, 70, 71
	54	1961	Pre-existing road (first visible 1944)	18, 30, 62, 70, 71
	55	1961	Pre-existing road (first visible 1944)	4, 31, 62, 70, 71

Of Potential Concern?	Anomaly #	Year of Change	Discussion	Related Anomalies ¹
	56	1961	Road widened	18, 62, 70
	57	1961	Road widened	18, 29, 64
	58	1969	Pre-existing road (first visible 1954)	21, 22, 50, 59, 65, 66, 73
	59	1969	Former road (first visible 1954)	21, 22, 50, 58, 65, 66
	60	1969	Pre-existing unidentified object (first visible 1944)	7, 25, 51, 68
Yes	61	1969	Trees cleared	None
	62	1969	Pre-existing road (first visible 1944)	3, 4, 27, 31, 52-55, 70, 71
	63	1969	Former road (first visible 1961)	56
	64	1969	Former road (first visible 1961)	57
Yes	65	1982	Trees cleared	None
	66	1982	Road (first visible 1954)	21, 22, 50, 58, 59, 65, 73
Yes	67	1982	Trees cleared	None
	68	1982	Former unidentified object (first visible 1944)	7, 25, 51, 60
	69	1982	Landscaping	72
	70	1982	Pre-existing road (first visible 1944)	3, 4, 27, 31, 52-55, 62, 71
	71	1994	Pre-existing road (first visible 1944)	3, 4, 27, 31, 52-55, 62, 70
	72	1994	Pre-existing landscaping (first visible 1982)	69
	73	1994	Pre-existing road (first visible 1954)	21, 22, 50, 58, 66

¹ Related anomalies refer to anomalies which are carried forward from year to year (e.g., a trail) or anomalies which change (e.g., the extension or widening of a trail or cleared area).

11.4 ANOMALIES OF POTENTIAL CONCERN

Seventy-three anomalies were identified during the photographic interpretation of the D & I Area. All anomalies have been resolved except four unidentified objects. Eight anomalies are considered to be of potential concern. To facilitate anomaly tracking, the anomalies of potential concern were mapped using the anomaly tracking number assigned in the year-by-year analysis (see Table 2 and Fig. 4). Table 2 provides information for each anomaly of potential concern, including the anomaly tracking number, coordinates for the approximate center of the anomaly (coordinates provided in Alabama State Plane East, North American Datum [NAD] 83), the year the change occurred, and the reason for the anomaly.

THIS PAGE INTENTIONALLY LEFT BLANK

Fig. 3a

Fig. 3b

Fig. 3c

Fig. 3d

Fig. 3e

Fig. 3f

Fig. 3g

Fig. 3h

Table 2. D & I Area - Anomalies of Concern

Anomaly #	Alabama State Plane Coordinates (approximate anomaly center)		Year of Change	Discussion
	X-Coordinate	Y-Coordinate		
7	668338.96689	1166119.64712	1944	This unidentified anomaly is first apparent in the 1944 photographs. The anomaly is beside one of the many buildings present in 1944. The anomaly is present in photographs acquired in 1954, 1961, and 1969. The anomaly is not evident in photographs acquired in 1982.
15	668319.14441	1165873.57500	1944	This unidentified anomaly is first apparent in the 1944 photographs. The anomaly is south of the many buildings present in 1944. The anomaly is not evident in photographs acquired in 1954.
16	668327.34681	1165842.13245	1944	This unidentified anomaly is first apparent in the 1944 photographs. The anomaly is not evident in photographs acquired in 1954.
17	668327.34681	1165825.72764	1944	This unidentified anomaly is first apparent in the 1944 photographs. The anomaly is not evident in photographs acquired in 1954.
40	668245.32278	1165869.47380	1954	Trees were cleared from this area between 1944 and 1954. The area remained clear in photographs acquired in 1961, however, by 1969 vegetation regrowth was underway. By 1982, the area had become reforested.
61	668386.13071	1166172.27921	1969	Trees were cleared from this area between 1961 and 1969. By 1982, vegetation regrowth was underway and by 1994, the area had become reforested.
65	668215.93083	1166168.86154	1982	Trees were cleared along the road in the northwest corner of the study area between 1969 and 1982. By 1994, vegetation regrowth was underway.
67	668248.74044	1166146.30493	1982	Trees were cleared from this area between 1969 and 1982. By 1994, vegetation regrowth was underway.

THIS PAGE INTENTIONALLY LEFT BLANK

Figure 4